



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER OF PATENTS AND TRADEMARKS  
Washington, D.C. 20231  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/002,978	12/06/2001	Jung-Yu Hsieh	4425-224	4986

7590 11/04/2002  
LOWE HAUPTMAN GILMAN & BERNER, LLP  
Suite 310  
1700 Diagonal Road  
Alexandria, VA 22314

EXAMINER

LE, THAO X

ART UNIT PAPER NUMBER

2814

DATE MAILED: 11/04/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/002,978

Applicant(s)

HSIEH ET AL.

Examiner

Thao X Le

Art Unit

2814

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 September 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 04 September 2002 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 112*

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 20-28 are rejected under 35 U.S.C. 112, second paragraph, as failing to set forth the subject matter which applicant(s) regard as their invention. Evidence that the independent claim 20 line 4-5 recites 'forming a first oxide layer on said substrate, wherein said first oxide layer includes not essentially Cl' is unclear. It is unclear from the above recitation as to what applicant intend to include/exclude. Clarification is required. Claims 21-28 are rejected at least for dependency from rejected claim 20.

### *Claim Rejections - 35 USC § 102*

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in-

(1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b) only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or

(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

4. Claims 1-19 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,163,050 Hisatomi et al.

Art Unit: 2814

Regarding to claims 1-19, please refer to previous Office Action in paper No. 2.

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 20-22, 25 and 27-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6163050 to Hisatomi et al. in view of US 6323,142 to Yamazaki et al.

Regarding to claims 20-21, Hisatomi discloses a method for forming an oxide-nitride-oxide structure fig. 2 in one chamber, the method comprising the steps of: providing a substrate 33, column 6 line 35, forming a first oxide layer 36-1, column 6 line 44, on substrate, forming a first buffer layer 36-4, column 7 line 38, on first oxide layer, forming a silicon nitride layer 36-2, column 6 line 50, on first buffer layer, forming a second buffer layer 36-5, column 7 line 41, on silicon nitride, and forming a second oxide layer 36-3, column 6 line 56, on second buffer layer.

But, Hisatomi does not expressly disclose the first oxide layer not includes Cl, and wherein the first and second oxide layers are formed by introducing silane gas and nitrogen oxide gas.

However, Yamazaki reference discloses the oxide film not includes Cl, column 13 lines 13-25. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use the oxide film formation by the silane and nitrogen oxide teaching of Yamazaki with Hisatomi method, because it would have created a oxide film

Art Unit: 2814

with superior in step coverage, lower in carbon content, low in hygroscopicity, and superior in impurity blocking performance as taught by Yamazaki, column 3 line 5-10. In addition, such oxide film formation by using silane gas and nitrogen gas is well known in the art as it is being disclosed by Applicant Admitted Prior Art (APA), specification page 3.

Regarding to claim 22, 25 Hisatomi discloses the method wherein the first and second buffer layer 36-4 and 36-5 is SiON, fig. 2, column 7 lines 39-41.

Regarding to claim 28, Hisatomi discloses the method wherein the oxide-nitride-oxide structure is formed on the wafer, fig. 2.

6. Claims 23, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6163050 to Hisatomi et al. in view of US 5976991 to Laxman et al.

Regarding to claims 23, 26, Hisatomi disclose the method wherein first and second buffer layers, 36-4 and 36-5, are formed by introducing dichloro silane, nitrogen oxide, and ammonia, column 7 lines 37-38.

But Hisatomi does not expressly disclose the method wherein first and second buffer layer is formed by introducing silane, nitrogen oxide, and ammonia.

However, Laxman reference discloses the buffer layer is formed by introducing silane, nitrogen oxide, and ammonia, column 5 lines 56. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use silane, nitrogen oxide, and ammonia to form SiON teaching of Laxman with Hisatomi method, because it would have created a dielectric film with low hydrogen contamination, as well as avoiding chloride contamination as taught by Laxman, column 2 lines 55-60.

7. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6163050 to Hisatomi et al. in view of US 6326692 to Pangrele et al.

Regarding to claim 24, Hisatomi discloses the method wherein the silicon nitride layer 36-2, column 6 line 50, is formed by introducing dichloro silane and ammonia, column 6 line 46.

But Hisatomi does not disclose the method wherein the silicon nitride layer is formed by introducing silane and ammonia.

However, Pangrele reference discloses the silicon nitride layer 202, column 7 line 20, fig. 3. At the time the invention was made; it would have been obvious to one of ordinary skill in the art to use silane and ammonia to form silicon nitride teaching of Pangrele with Hisatomi, because it would have created a dielectric layer having a chemical bonds that are chemically reactive with a predetermined reactant, see abstract. Also, such silicon nitride film formation by using silane gas and ammonia gas is well known in the art as it is being disclosed by Applicant Admitted Prior Art (APA), specification page 3.

### ***Response to Arguments***

8. Applicant's arguments filed 09/04/02 have been fully considered but they are not persuasive. The Applicant argues that the Hisatomi discloses dichloro silane, which is different from the material in the present claim, and Hisatomi has not taught that all the films are formed in one chamber. The Examiner respectfully disagrees because Hisatomi disclose the gas comprising silane, column 6 line 40, thus it meets claim language requirements. Although the claims are interpreted in light of the specification, limitations from the specification are not read

Art Unit: 2814

into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). With respect to one chamber, Hisatomi discloses the continuous process with the same device for forming dielectric layers, column 6 lines 45-55, therefore such dielectric layer formation occur in one chamber.

### *Conclusion*

9. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thao X Le whose telephone number is 703-306-0208. The examiner can normally be reached on M-f from 8:00 AM - 4:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael M Fahmy can be reached on 703-308-4918. The fax phone numbers for the

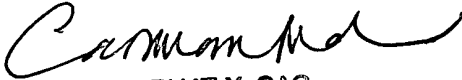
Application/Control Number: 10/002,978

Art Unit: 2814

organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

Thao X. Le  
October 28, 2002

  
PHAT X. CAO  
PRIMARY EXAMINER